POWER EQUIPMENT TECHNOLOGY 1, 2, 3, and 4
ACTIVITY COURSE CODES: 6300, 6301, 6302, 6303

(Effective in the 2013-14 CATE Student Reporting Procedures Manual: The program name Small Engine Repair Technology will change to Power Equipment Technology.)

Course Description:

The Power Equipment Technology program is designed to prepare students to perform entry-level maintenance and repair tasks under the supervision of an experienced technician. Students receive training on small internal combustion engines used on portable equipment such as lawn mowers, chain saws, rotary tillers, motorcycles, pumps, compressors, and small boats. The training includes locating and solving problems, using specialized test equipment, overhauling the basic engine, and repairing or replacing engine systems.

Objective:

Given the necessary equipment, materials, and instruction, students, on completion of the prescribed course of study, will be able to successfully accomplish the following core competencies; they will complete a minimum four-unit sequence of CATE courses in order to be completers of the Power Equipment Technology program.

Credit: 1, 2, or 3 Carnegie units (per course code; dependent upon schools' bell schedules)

Resources:

www.mysctextbooks.com
Valvoline CareerTech complete oil curriculum, http://valvolinevotech.com
www.SP2.org (safety)
Motorcycle textbook

A. WORK SAFETY PRACTICES

1. Demonstrate the ability to work safely.
2. Demonstrate the ability to keep a clean, orderly, safe work area.
3. Demonstrate use of a fire extinguisher.
4. Demonstrate the safe use of hand and power tools.
5. Demonstrate safe dress and use of relevant safety gear and personal protective equipment (PPE).
6. Discuss the importance of Environmental Protection Agency (EPA) regulations/guidelines related to power equipment.
7. Explain the functions of OSHA.

B. IDENTIFYING THE OPERATION OF INTERNAL COMBUSTION ENGINE SYSTEMS

1. Identify four-cycle engine components.
2. Identify two-cycle engine components.
3. Describe the operation of engine systems.
4. Determine engine identification from engine decal.

C. DEMONSTRATING SKILL IN THE SERVICING, REPAIR, AND MAINTENANCE OF THE FUEL SYSTEM

1. Service or replace a fuel filter.
2. Clean fuel tank and lines.
3. Service and adjust a vacuum-type carburetor.
4. Service and adjust a float-type carburetor.
5. Service and adjust a diaphragm-type carburetor.
6. Remove and replace a fuel pump.
7. Remove and replace primer bulb.
8. Identify/Test level of ethanol.
9. Remove and replace fuel shut-off switch.

D. DEMONSTRATING SKILLS IN THE SERVICING, REPAIR, AND MAINTENANCE OF THE IGNITION SYSTEM

1. Gauge and replace a spark plug.
2. Remove and replace a flywheel using proper tools.
3. Test and replace an ignition coil.
4. Adjust armature air gap.
5. Test and replace an ignition kill wire.
6. Replace a rectifier.
7. Replace a diode assembly.
8. Troubleshoot a capacitor discharge ignition (CDI) system.
9. Remove and replace a safety switch.
10. Remove and replace a brake band assembly.

E. DEMONSTRATING SKILLS IN THE SERVICING, REPAIR, AND MAINTENANCE OF THE EXHAUST SYSTEM

1. Remove carbon buildup from a muffler.
2. Clean exhaust port, pipes, and muffler screen.
3. Remove and replace a muffler.

F. DEMONSTRATING SKILLS USED IN THE OVERHAUL OF POWER EQUIPMENT ENGINES

1. Disassemble and inspect engine components.
2. Measure engine wear with precision measuring instruments.
3. Grind valves and valve seats.
4. Lap valves with grinding compound.
5. Deglaze and clean a cylinder.
6. Repair damaged threads using tap and die set.
7. Repair damaged threads using thread insert.
8. Remove and replace oil seals.
9. Replace a crankshaft.
10. Install piston rings.
11. Replace a piston and connecting rod assembly.
12. Install valve lifters.
13. Replace a camshaft.
14. Replace an oil dipper, slinger, or pump.
15. Install a crankcase cover or sump.
16. Adjust and install valves.
17. Install a cylinder head.
18. Service a crankcase breather.
19. Install a short block assembly.

G. DEMONSTRATING SKILLS USED IN THE SERVICING AND REPAIR OF ENGINE STARTERS

1. Remove and replace a starter spring.
2. Remove and replace a starter clutch.
3. Remove and replace a rope/starter pulley.
4. Remove and replace starter pawls.
5. Remove and replace a starter cup.
6. Remove and replace a starter rope.

H. DEMONSTRATING SKILLS USED IN THE SERVICING AND REPAIR OF ELECTRICAL SYSTEMS

1. Service, test, and replace a battery.
2. Troubleshoot a starting circuit.
3. Replace a starter motor.
4. Remove and replace alternator or starter motor bearing or brushes.
5. Troubleshoot a charging circuit.
6. Remove and replace a voltage regulator.
7. Remove and replace starter solenoid.
8. Remove and replace ignition switch.

I. DEMONSTRATING SKILLS USED IN SERVICING, MAINTAINING, AND REPLACING CLUTCH AND DRIVE MECHANISMS

1. Remove and replace a centrifugal clutch.
2. Remove and replace an electric PTO.
3. Repair a belt clutch.
4. Repair and adjust a belt drive assembly.
5. Repair a friction drive.
6. Change fluid in a hydrostatic transmission.
7. Repair a manual transmission.
8. Repair a differential.

J. DEMONSTRATING SKILLS USED IN ORDERING PARTS AND MATERIALS AND IN MAINTAINING RECORDS

1. Determine parts numbers from an illustrated parts list.
2. Update replacement parts numbers and prices using catalog.
3. Determine parts numbers using digital media.
4. Estimate total cost of repairs.
5. Complete a work order form.
6. Complete a warranty form.

K. DEMONSTRATING SKILLS USED IN LAWN AND GARDEN EQUIPMENT REPAIR

1. Adjust mower cutting height.
2. Grind and balance a rotary mower blade.
3. Remove and replace a blade adapter.
4. Lubricate a riding mower.
5. Remove and replace self-propelled drive wheel.
6. Clean, inspect, and service a riding mower.
7. Remove, replace, and adjust a throttle cable.
8. Remove and replace steering rods and bushings.
9. Adjust tow-in on a riding mower.
10. Remove and replace a wheel bearing.
11. Remove and replace a wheel.
12. Overhaul a mechanical brake caliper.

L. DEMONSTRATING SKILLS USED IN CHAIN SAW REPAIR

1. Troubleshoot cutter problems.
2. Sharpen a chain.
3. Inspect and grind depth gauges.
4. Replace a floating sprocket.
5. Replace a clutch and integral sprocket.
6. Lubricate a roller nose bar.

7. Replace a guide bar.
8. Replace and adjust a chain.
9. Install a guide bar.
10. Remove and replace a manual oiler.
11. Remove and replace an automatic oiler.
12. Remove and replace chain brake assembly.

M. DEMONSTRATE BASIC ENGINE CARE

1. Identify engine and determine type and weight of oil.
2. Change engine oil.
3. Replace oil filter.
4. Service or replace a dry element air filter.
5. Service or replace a foam-type air filter.
6. Clean cooling systems.
7. Grease zerk fittings.
8. Lube throttle cable.
9. Sharpen and balance blade.

OPTIONAL UNITS

N. DEMONSTRATING SKILLS USED IN SETTING UP A CUTTING TORCH/WELDING

1. Set up an oxyacetylene station.
2. Light and adjust the cutting torch.
3. Lay out and burn straight cuts in sheet metal.
4. Light and adjust the welding torch.
5. Carry a puddle without filler rod (flat position).
6. Carry a puddle with filler rod (flat position).
7. Construct an outside corner joint (flat position).
8. Braze lap and T-joints.
9. Set up and adjust a shielded metal arc welding station.
10. Weld a straight bead pattern (flat position).

O. DEMONSTRATING SKILLS USED IN OUTBOARD MOTOR REPAIR

1. Disassemble and clean an outboard engine.
2. Service an outboard engine.
3. Replace outboard gear drive components.
4. Lubricate an outboard lower unit.
5. Replace a propeller and sheer pin.
6. Replace a drive shaft and bearing.
7. Replace a drive shaft pinion.
8. Replace a clutch dog.
9. Replace a swivel bracket.

10. Perform an operational test of the cooling system.
11. Lubricate transom steering bushings.
12. Replace lower unit seals.
13. Clean a gas tank pickup tube.